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EFFECT OF BITTER KOLA ON BLEEDING TIME AND BLOOD PRESSURE IN A SUBJECT FROM JOS-NIGERIA.

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ABSTRACT

Bitter Kola (*Garcinia kola*) is highly valued in Herbal / African folk medicine because of its varied and numerous uses which are social, economic and medicinal, thus making it an essential ingredient in African medicine. The study reviews some related literature on the action of bitter kola on blood pressure and bleeding time and as well presents a case of the effect on a volunteered subject. Bitter kola from our study has shown decrease in Systolic and Diastolic Blood pressure and pulse rate every 30 minute within 2 hours but reverses after 2 hours. Bleeding time increases every 30 minutes within 2 hours but started decreasing after 2 hours. Other studies showed that Bitter kola has anti-inflammatory, analgesic, molluscidal, anti-atherogenic, antioxidant, antidiabetic and hepatoprotective but this study adds that it is cardio-protective in hypertension and in excess blood clotting. However, Blood donors and those at the risk of accident should not take bitter kola as snacks till after the blood donation or accident free experience.

Keywords: Bitter kola, Bleeding time, Blood pressure, Herbal medicine

1. Introduction

Bitter Kola (also known as *Garcinia kola*) is a species of flowering plant and a 3-5cm length ellipsoid shape nut belonging to the Mangosteen genus *Garcinia* of the family Clusiaceae with a deep brown peel cover. Recently, Bitter kola found in African countries especially in Nigeria has been of high interest in African medicine research (Obeta et al. 2021a; Etim et al 2020). Bitter kola has a bitter taste in the mouth when consumed and it derives its name from its bitter taste as a quality to describing it. It is used for both medical and traditional purposes and is mostly used in African culture (Mike, 2021).

Garcinia kola is traditionally used by African folk healers who believe that it has purgative, antiparasitic, and antimicrobial properties. The seeds are used for liver disorders, bronchitis, throat infections, colic, head or chest colds, and cough. It is also used as a chewing stick (Maurice, 1999). Several studies have been carried out on the phytochemical components of *Garcinia kola* showing that it contains alkaloids, saponins, tannins, flavonoids, glycosides, sterols, and phenols on one side; kolaviron, garcinia biflavonoid, kolaflavonone, benzophenone, xanthone, coumarin, apigenin, quercetin, and garcinoic acid on the other side. (Ukaoma et al., 2013; Anna et al., 2019; Obeta et al., 2021b) with other food (diets) components, such oils, minerals and many more.

It is believed that some of these components isolated like oleoresin, tannin, saponins, and alkaloids etc must have contributed in the social and medicinal uses in African medicine including difficult illnesses (Mañnourová et al., 2019).

Blood pressure is the force that moves blood through the circulatory system. It is an important force because oxygen and nutrients would not be pushed around the circulatory system to nourish tissues and organs without blood pressure. Naiho & Ugwu (2009), Kuate et al., (2021), have demonstrated that bitter kola consumption reduced blood pressure in human and animals including the ocular pressure (Ilechie et al., 2020 Timothy et al., 2016)

Bleeding time is a measure of the time required for bleeding to stop. Any abnormalities in clotting times can be the result of decreased quantity or function of the coagulation factors involved. (Dayyal, 2016). About the effect on haematological parameters, Elekwa et al (2003) reported that aqueous extract of GK stabilized the membranes of HbAA, HbAS and HbSS human erythrocytes and reduced blood viscosity. Kpahe et al (2022) showed that bitter kola gave a significant decrease in bleeding time but with a significant increase platelet count. Ahumibe & Braide (2009) found out that Prothrombin time (PT) and activated partial thromboplastin time (APPT) were both prolonged with increased bitter kola dosage.

This work was aimed at investigating the effect of *Garcinia kola* on bleeding time and blood pressure with specific objectives:

- To determine the changes in blood pressure due to bitter kola consumption
- To fine out the changes in clotting time after bitter kola consumption
- To ascertain if bitter kola should be taken before any blood sample collection procedure or accident

2.1 Materials

- Bitter Kola
- Lancets
- Weighing Balance
- Stop watch
- Cotton Wool
- Paper
- Stethoscope
- Sphygmomanometer

2.2 Collection of Bitter kola

Seed of *Garcinia Kola* was purchased from Terminus market, Jos, Plateau state, Nigeria. The seed was weighed using a weighing balance and the constant weight was obtained (13.5g), the brownish dark covering of the seed were removed and washed using clean water and allowed to dry for 3 to 5 minutes. The 13.5g of the seed was chewed by a student. The blood pressure and bleeding time was measured 4 times every 30 minutes interval.

2.3 Participating Subjects or Students

The study was carried out on a student volunteer of Federal College of Medical Laboratory Science & Technology, Jos, Plateau state, Nigeria who willingly consented to participate in the study. The basal parameters - were determined before bitter kola was taken.

2.4 Consumption of bitter kola

The Bitter kola seed was weighed after removing the brownish dark covering of the seed with the aid of a weighing balance showing that the seed used was 13.5g. The bitter kola was washed under a running clean tap water. The 13.5g of the seed was chewed by the student volunteer weighing 90kg and 1.8m height.

2.5 Procedure of Measuring of Blood Pressure (Bp)

A stethoscope was placed over the major artery in the upper arm (brachial artery) to listen to blood flow. The cuff was inflated with a small hand pump. As the cuff inflates, it squeezes the arm. Blood flow through the artery stops for a moment. The valve was opened on the hand pump to slowly release the air in the cuff and restore blood flow. Blood pressure was recorded by listening to the blood flow and pulse

2.6 Procedure for Measurement of Bleeding time

The puncture site (tip of 3rd finger) was cleaned using an antiseptic to minimize the risk of infection. Using a lancet, a prick was made on the finger to cause bleeding. Using a stopwatch, the blood was blotted continuously until the bleeding stops. Time taken until bleeding stopped was recorded.

3. Result

The effects of *Garcinia kola* seed on blood pressure and bleeding time activities are shown in Table 1 and figures 1 & 2 below. The 13.5g seed of *Garcinia kola* was chewed by a 90kg and 1.8m height individual and was found to produce a decrease in Systolic and Diastolic Blood pressure (123/77MmHg), decreased to 116/72MmHg before reversing to 120/74MmHg while bleeding time increased from 21s to 28s before reversing to 26s. Pulse rate decreased from 67bpm to 57bpm before starting to increase to 60bpm at 120 minutes.

Table 1: The effect of bitter kola on bleeding time and blood pressure.

Time interval (Minutes)	Blood pressure (MmHg)	Bleeding time (Seconds)	Pulse Rate (bpm)
0 (Control)	Systolic: 123 Diastolic: 77	21	65
30	Systolic: 117 Diastolic: 75	22	64
60	Systolic: 119 Diastolic: 74	25	62
90	Systolic: 116 Diastolic: 72	28	57
120	Systolic: 120 Diastolic: 74	26	56

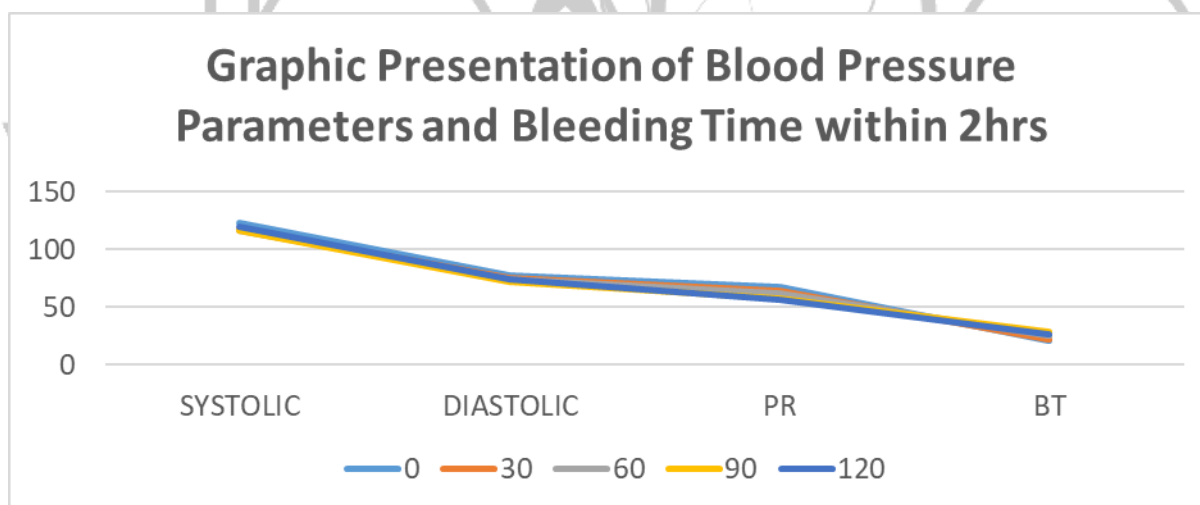


Figure 1 Blood Pressure Parameters and Bleeding Time within 2hours

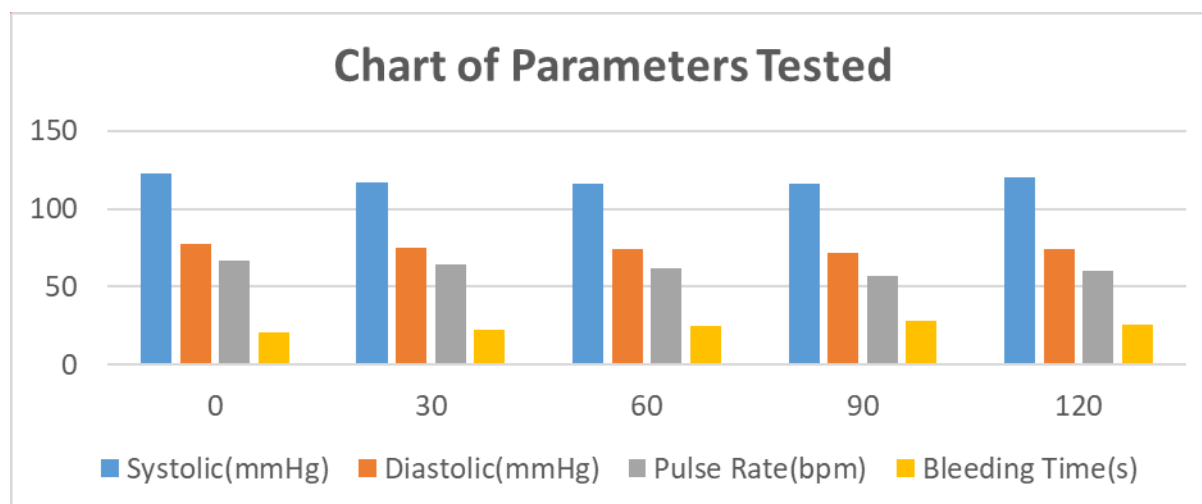


Figure 2 Bar chart of Parameter at Intervals of 30 minutes

4. Discussion

The study of a student volunteer presented that after eating of Bitter kola (13.5g) there was a decrease in Systolic, diastolic and pulse rate from 30-90 minutes but started increasing at 120 minutes.

The decrease in systolic, diastolic and pulse rate within 2 hours of chewing is consistent with the works of Naiho & Ugwu (2009), Kuate et al., (2021), Ilechie et al., (2020). Timothy et al., (2016) which also demonstrated that bitter kola reduced blood pressure in human and animals including the ocular pressure.

This suggests that bitter kola can reduce blood pressure at intervals and could assist in management of heart related challenges especially cardiac challenges associated with Hypertension.

On the other hand, the bleeding time showed an increase from 30-90 minutes but started decreasing at 120 minutes. This study agrees with the studies carried out by Kpahe et al., (2021); Fidele et al., (2022) and Ahumibe & Braide (2009) that showed that bitter kola decreased the bleeding time in their studies.

The study therefore postulates that the use of bitter kola as snacks before blood

sample collection, blood donation and any cut or accident can increase bleeding time if not controlled within 1 hour.

The study is limited by the fact that only a subject is used and this can further be substantiated by using a large sample and appropriate statistical parameter to determine the significance.

5. Conclusion

Feeding a 90kg and 1.8m height individual with 13.5g of Garcinia kola seed caused some decrease in blood pressure, pulse rate and increase in bleeding time within 2 hours but reverses after 2 hours. The decrease in blood pressure induced by Garcinia kola seed suggests that the kola seed may be good for high blood pressure management.

Also, bleeding time can be prolonged by bitter kola and such can affect the heart in cases of accident or blood loss.

Chewing bitter kola as snacks should not be done when at risk of accident or ready for blood donation to avoid increase in bleeding time.

The authors hereby recommends as follows:

That patients or subjects who are meant to go for blood sample collection should

avoid chewing bitter kola till after the medical exercise.

- ii. That blood donors should avoid eating bitter kola as snacks before blood donation
- iii. That Bitter kola use as snacks by high blood pressure patients should be encouraged
- iv. That further studies should be carried out with large number of subjects

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